

Slave MPS-S20

Standard slave display (L18)



Notable functions:

1. Connects to most standard systems to display select information.
2. Can be connected with an array of other compatible displays from Microbus.
3. Built in communication ports for RS232, RS485, RS422.
4. Selectable baudrate 9600 / 38400.
5. Selectable adress to connect more than one display to the same system.
6. Large variation of selectable sizes and configurations of charachters.

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General information

This unit have no internal calculation or timer functions, relying solely on signal input from an external unit, either another compatible display from Microbus, mirroring it's information, or from an PC or PLC unit.

This unit replaces and are backwards compatible with the previous "L18" slave unit from Microbus.

The previous "L18" protocol can be used, but this unit supports newer additional functions.

General information about communication:

RS232:

The most common standard, established in 1969 by EIA (Electronic Industries Association), as well as Bell-laboratories and a number of other manufacturers. A corresponding standard was published internationally by CCITT and is termed V.24. Most computers and computerised equipment can utilize RS232 communication, or have accessories enabling it.

The signal levels are +12V/-12V. The drawbacks of RS232 is the short transmission range with a maximum of about 30 meters, in conjunction with the limitation to only use one display per port .

RS485 / RS422:

Both standards utilize a signal level of +/- 3V. Their differences are that RS485 can work in half duplex, using one single wire pair for two way communication, while RS422 needs two wire pairs for two way communication.

Both standards allow transmission length of up to 1200 meters of cable with adequate shielding and grounding, and can connect to a large number of displays on a single port.

As many modern computers and laptops lack the needed ports to use both RS232 and RS485/422 communication, an external adaptor can be used. If the computer is equipped with a RS232 compatible port, a simple adapter can convert the signal to RS485 standard.

TCP/IP:

The display unit has an optional TCP/IP network interface as an add-on option, enabling the use of a pre-existing network. This is not supplied as default, to minimize costs, and needs to be specified upon order.

☐

Customer adapted unit.

☐

Factory standard.

Notes for individual customer adaptations:

Start Sequence

När displayen startar körs en sekvens med information. Nedan följer en förklaring med exempel på vad denna betyder.

Step 1. "8888" All display segments, outputs, and the relay is active

Step 2. xxxx Program version is shown

Step 3. "9600" Selected baudrate is shown ("9600" or "384" (38400))

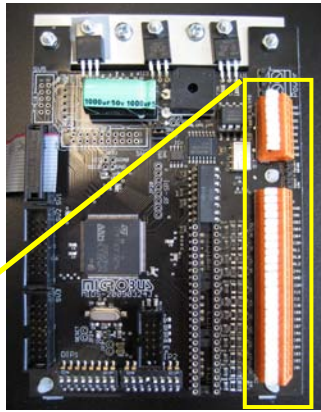
Step 4. "1003" Selected display adress is shown (1000-1015)

Step 5. "--01" Each segment group displays their individual adress.

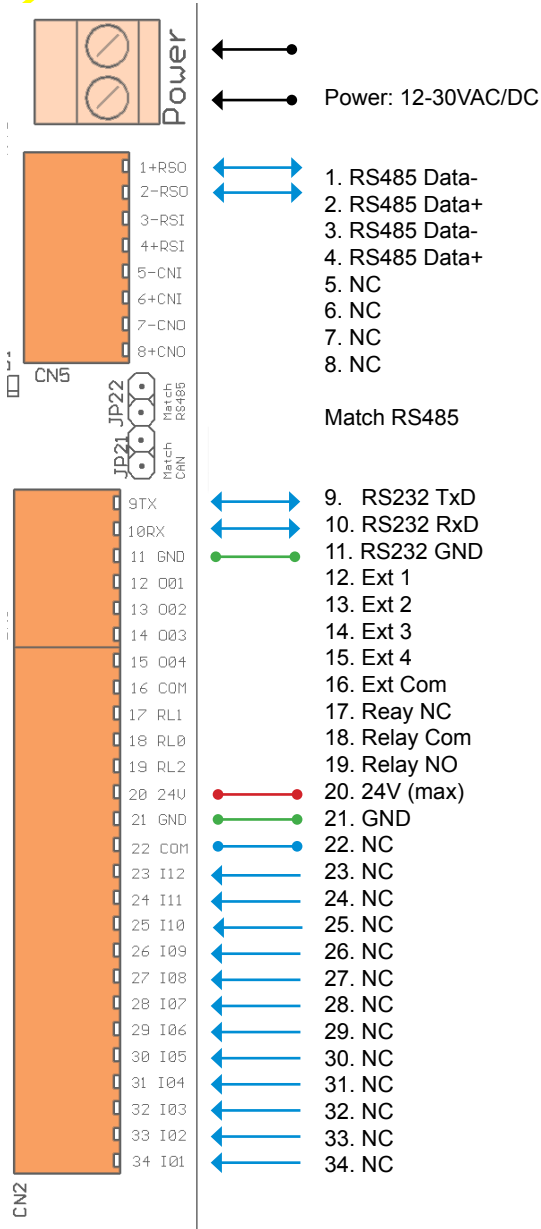
-> Done. the display is ready to receive data, and will display "----" after one minute without data. (Timeout)

Dip switch 7 (2-1) deactivates the sequence.

Connections



The two segments of numbered connectors on the MIDS left edge are used to connect all signals to and from the display, such as RS-232/485 to a PC or PLC and relay signals.



When using 77mm segments 12VAC is recommended to avoid excess heat build up. Using 165mm segments requires 30VAC to be supplied to the MIDS. Using 230/360mm segments the MIDS can be supplied with 12VAC but the segments require 24VAC.

RS485/422 port.
(9600,n,8,1 or 38400,n,8,1 depending on settings)

Using longer than normal cables requires you to activate an end point resistor to match the cable resistance.

RS232 port.
(9600,n,8,1 or 38400,n,8,1 depending on settings)

Ext 1-4 optocouplers controlled by software commands.
(for instance D00L0010)
Common connector for Ext 1-4, connector 12-15.

Relay controlled by software commands.
(D00R0000 or D00R0001)

Connecting a relay or switch



Connecting PLC/external equipment

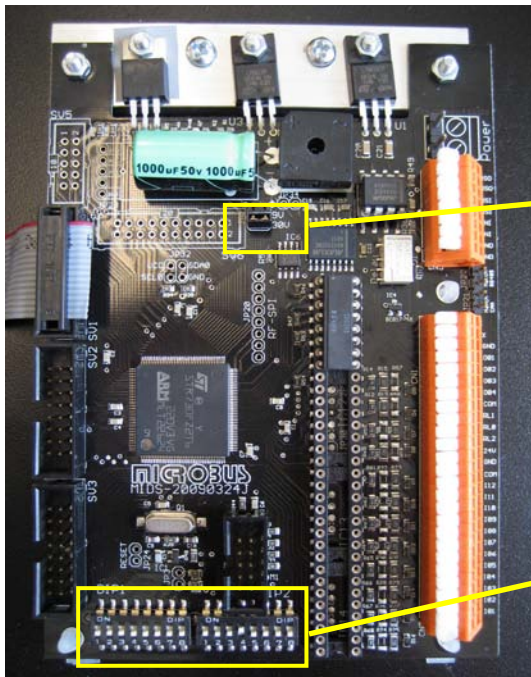


Connecting a photo resistor



Settings

The display can be configured for use in multiple ways, all options are available either by dip switches or jumpers on the main circuit board (MIDS).



Power out to the 7-segment LED's. Switchable between 9V and 30V.

With 77mm, 230mm and 360mm arrays of 7-segment LED's, 9V is required.

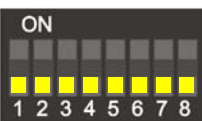
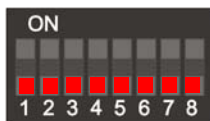
30V should ONLY be used with 165mm sized 7-segment LED's.

This option is usually pre-configured from the factory.

MIDS main unit dip switches. The switches are grouped 8+8, and the blocks are marked DIP1 (left) and DIP2 (right) on the PCB.

DIP-1

DIP-2



Standard factory configuration for Slave display MPS-S20. All switches are in the "off" position.

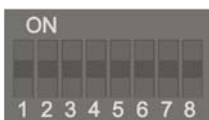
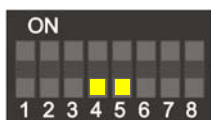
Dip-2 is compatible with the older version of the MIDS main unit. Start from this setting, and configure the display to your needs.

Communication

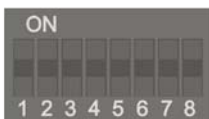
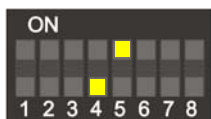
DIP-1

DIP-2

Tidsenhet:

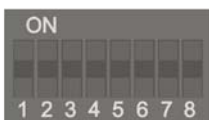
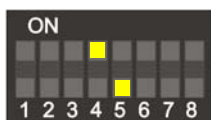


Standard Mode. The MIDS main unit is set to receive communication on both the RS232 and RS485 ports. Baudrate according to settings.



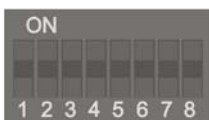
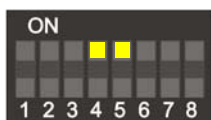
LED-matrix Mode.

The MIDS main unit receives communication on the RS232 port, and a Microbus compatible LED-matrix display can be connected to the RS485 port. **(The RS485 baudrate is set to 9600 regardless of setting)**



LED-matrix Mode.

The MIDS main unit receives communication on the RS485 port, and a Microbus compatible LED-matrix display can be connected to the RS232 port. **(The RS232 baudrate is set to 115200 regardless of setting)**

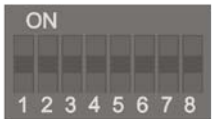
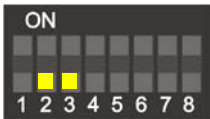

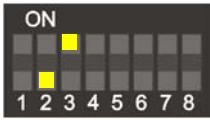
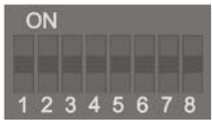
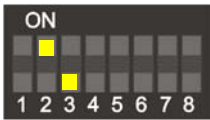

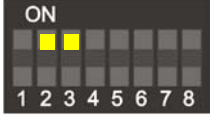




LED-matrix Mode.

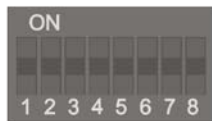
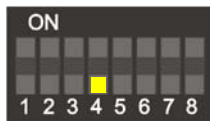
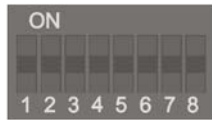
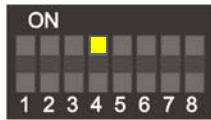
The MIDS main unit receives communication on the RS485 port, and a Microbus compatible LED-matrix display can be connected to the RS232 port. **(The RS232 baudrate is set to 9600 regardless of setting)**

7-segment drivers


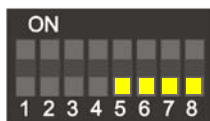
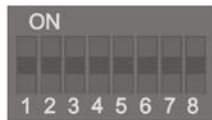
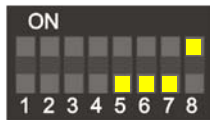
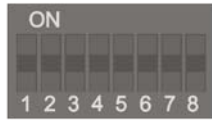
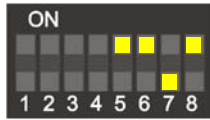

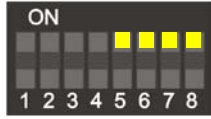
These settings configure the SV1 to SV3 ports according to what type of 7-segment LED's that are connected to the MIDS main unit. This is normally configured from the factory.

DIP-1	DIP-2	7-segment driver: (by unit height)
		Port SV1: 77mm / 165mm Port SV2: 77mm / 165mm Port SV3: 77mm / 165mm
		Port SV1: 77mm / 165mm Port SV2: 77mm / 165mm Port SV3: 230mm / 360mm
		Port SV1: 230mm / 360mm Port SV2: 230mm / 360mm Port SV3: 77mm / 165mm
		Port SV1: 230mm / 360mm Port SV2: 230mm / 360mm Port SV3: 230mm / 360mm
		7-segment test. The output is dependant on the active driver. activating this mode disables the normal start up procedure, and can be used to speed up starting the display.

Baudrate RS232 och RS485

DIP-1	DIP-2	Baudrate:
		9600, n, 8, 1
		38400, n, 8, 1

Address

DIP-1	DIP-2	Address:
		1000 (default)
		Example: 1001
		Example: 1013
		Example: 1015

Binary coded combinations of dip 5 - 8 set the address of the display (1000-1015). A restart is required to activate the new setting.

If the normal starting procedure is activated, the currently set adress is displayed at start up.

DIP2:8 = LSB

Communication Protocol

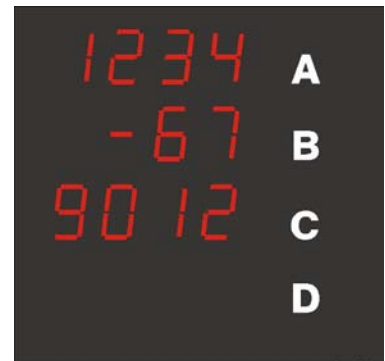
- The protocol is based on sending a unique display address followed by a group or segment address and the accompanying data, ending the transmission with the character X.
- The standard address of the display is 1000, and the groups of segments are numbered from left to right, top to bottom, starting with group 01.
- The simplest display consist of only one group with 4 characters. This meanst that the display address is 1000, with the segment group 01.
- The display address, **S12A1000M** consists of two parts each four bytes. The first part is the protocol header, and is always "S12A". Part two is the actual address (typically: 1000- 1015) and the address is terminated with an "M".
- The string needs to be sent as a complete cohesive packet.
- The display sends no aqnowledgement, meaning that more than one display can be given the same adress, and show the same values.
- To avoid displaying old an inaccurate information, the displays have a built in time-out function, which is by default set to 60 seconds. To avoid time-out, displaying dashes on the display, the data should be updated, or resent within that time frame. The time can be adjusted, but it is highly recommended to keep the factory setting.

<Display address> <Group adress + data> <Group adress + data> . . . < X >

Example:

S12A1000MD01N1234D02N -67D03F9012D04 X

This example string means that group 1 displays "1234", group 2 displays "-67", group 3 flashes "9012" och group 4 displays a blank display (four blank characters). As seen on the image.



The simplest example of a display

Example:

S12A1000MD01N1234X



D = "Segment group"

01-99 = Group address
00 = Function

Segment data, in this case "1234"

Command

N = Display, Normal text

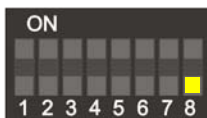
F = Display, Flashing text

R = Relay control

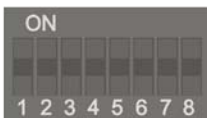
L = Software control of outputs (Ext 1-4)

Timeout

DIP-1

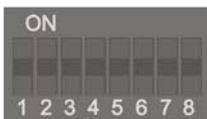
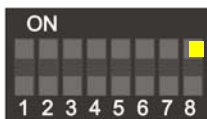


DIP-2



Factory Default. 60 seconds.

After 60 seconds without new information to a segment group, the segment will display "----".



1h.

After one hour without new information to a segment group, the segment will display "----".

Should only be used for signs with a non-critical update time.

Output: Ext 1-4 (I01, I02, I03, I04)

Example:

D00L1000 Activates only O01
D00L0100 Activates only O02
D00L0011 Activates O03 och O04
D00L1111 Activates O01, O02, O03, O04

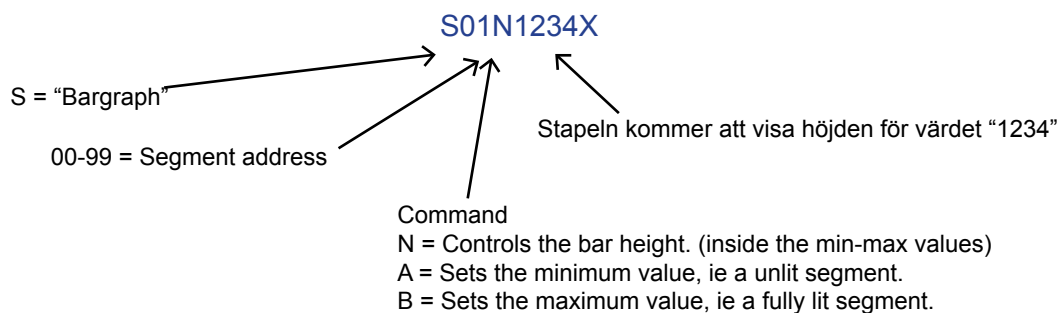
Relay funktion

D00R0000 Closes RL0 to RL1 (default)
D00R0001 Closes RL0 to RL2 (alarm)

Example:

S12A1007MD00R0001X

Bargraph display (Non standard display)



Example:

S12A1000MS01N0015X

S12A1000MS01A0000S01B0100X

S12A1000MS01B0020X

The bar is lit, displaying the equivalent to the numeric 15.

Sets the minimum as 0 and maximum as 100.

Sets the maximum as 20.

Address independant funtions

SHOW-SETMBX

Displays "8888" in all fields to verify LED function.

SHOW-SETMCX

Displays the main adress on all fields.

SHOW-SETMLX

Displays the segment adress on each segment.

SHOW-SETMDX

Displays the baudrate on all fields.

SHOW-SETMEX

Run the start sequence.

SHOW-SETMGX

Display the number of package errors during one hour. Experimental.

SHOW-SETMHX

Reboot.

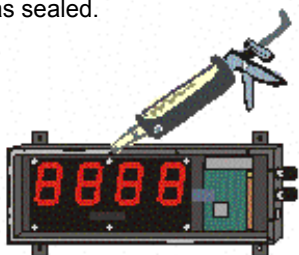
SHOW-SETMKX

Synchronises flashing fields for all connected displays.

Instruction for sealing the enclosure to IP65 class

If the display is mounted outdoors, or used in an otherwise exposed environment, the enclosure can be sealed with silicone sealant to make it IP65 classed.

The procedure isn't particularly challenging, but requires meticulous attention to details to ensure a leakproof seal. Please observe that any damage to the display from a failed seal are only covered by warranty if the display is delivered from Microbus as sealed.



Before beginning the process, ensure that all connections to the display is correctly made and the cable pass-throughs and block-off's are tight.

Go over the individual LED's and align them properly, as they are easily pushed out of alignment when you are working inside the display. Make sure to have the glass panel and screws easily accesible, and clean the glass from dirt and fingerprints. Clean the inside of the enclosure.



Place the enclosure on a flat and even surface, where you have sufficient room to work. Distribute an even bead (~5mm) of silicone sealant around the edge of the enclosure, centered on the edge.

Hold the glass by the edges with the glossy side down, and align it as close as possible. Dropping it down flat minimizes the smudged sealant on the inside of the glass.



Tighten down the glass firmly, pushing out the excess sealant. It helps to start with one screw in either corner first, to align the glass, then adding the rest. Do not overly torque the screws as it can crack the glass.

Excess sealant can be removed and shaped to an even seal with a soft spatula or similar while fluid, or left to cure and removed with a sharp knife. If you get sealant on the front of the glass, it's far easier to wipe away if it's left to cure first, trying to do it immediately only results in smudges on the frosted surface.

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